Climate Research: Quinn




Paleoclimatology

Dr. Quinn's research group use the geochemistry of marine sediments and corals to investigate climate variability and changes in mean climate state. The group is presently investigating modern and Holocene climate in the western Pacific Ocean, tropical Atlantic Ocean and the Gulf of Mexico. Research activities combine fieldwork to collect samples and geochemical determinations to create climate time series.

Research Activities in the Field

Recent coral drilling campaigns have been conducted offshore of Puerto Rico, Dry Tortugas, and Vanuatu. Fossil coral drilling on land has been conducted in the Solomon Islands and Vanuatu. Dr. Fred Taylor, a long-time colleague, plays a central role in these field expeditions.

Research Activities in the Lab

Analytical facilities are state-of-the science and are housed in lab space renovated in 2008. Instrumentation includes isotope ratio mass spectrometers with the capabilities to measure various light stable isotopes in carbonates, waters and organic matter. The lab also contains an inductively coupled plasma-spectrometer (ICP), wet chemistry facilities, student space and a coral sampling facility.

Recent/Active Research Projects

A Coral Perspective on Holocene Climate Variability in the Tropical Western Atlantic

Sub-centennial-scale Gulf of Mexico Sea-Surface Temperature Variability during the Holocene Epoch

A Coral-based Reconstruction and Analysis of Subdecadal- to Multidecadal-scale Climate Variability in the Cuban Sector of the Tropical North Atlantic/Caribbean Sea

Holocene/Deglacial Abrupt Climate Change and Variability of the Western Pacific Warm Pool from Multidecadal to Century Scale Coral

Seismic Profiling of Rapidly Subsiding Reefs on Sabine Bank, Vanuatu: Preparing for a Future Opportunity to Drill Ancient Reefs Representing Off-Peak and Lowstand Sea Levels During MIS 2-5

Multidecadal to Centennial Scale Variability in the Surface Ocean of the Northern Gulf of Mexico over the Late Holocene

Recent Publications (students)

Kilbourne, K., **Quinn, T.M.**, Webb, R.S., Guilderson, T.F., Nyberg, J., Winter, A., Taylor, F.W., Paleoclimate proxy perspective on Caribbean climate since the year 1751: evidence of cooler temperatures and multidecadal variability, Paleoceanography, doi 0.1029/2008PA001598, 2008.

Shen, CC, Li, KS, Sieh, K., Natawidjaja, D., Cheng, H., Wang, X., Edwards, RL, Lam, DD, Hsieh, YT, Fan, TY, Meltzner, AJ, Taylor, FW, **Quinn, TM**, Chiang, HW, Kilbourne, KH, Variation of initial $^{230}Th/^{232}Th$ and limits of high precision U-Th dating of shallow-water corals, Geochim. Cosmochim. Acta, 2008.

Maupin, C.R., **Quinn, T.M.**, Halley, R.B., Extracting a climate signal from the skeletal geochemistry of the Caribbean coral Siderastrea siderea. Geochem. Geophys. Geosyst., 9, Q12012, doi: 10.1029/2008GC002106, 2008.

Poore, R. Z., Delong, K., Richey, J. N., and **Quinn, T. M**, Evidence of multidecadal climate variability and the Atlantic Multidecadal Oscillation from a Gulf of Mexico sea-surface temperature-proxy record, Geo-Marine Letters, 29, 6, 477-484, 10.1007/s00367-009-0154-6, 2009.

Delong, K., Poore, R. Z., **Quinn, T.M.**, Mitchum, G.T., Poore, R. Z., Evaluating highly resolved paleoclimate records in the frequency domain for multi-decadal scale climate variability, Geophysical Research Letters, 36, L20702, doi:10.1029/2009GL039742, 2009.

Richey, J. N., Poore, R. Z., Flower, B. P., Hollander, D.H., and **Quinn, T. M.**, Regionally Coherent Little Ice Age Cooling in the Atlantic Warm Pool, Geophysical Research Letters, 36, L21703, doi: 10.1029/2009GL040445, 2009.